

Name: _____

Period: _____ Date: _____

AP Bio Module 19: Genetics, Student Learning Guide

Getting started

1. If possible, work in pairs (share a computer).
2. Go to www.sciencemusicvideos.com. Select the AP Biology Menu. Then select "Module 19: Genetics. Start with "Mendelian Genetics and Punnett Squares

Tutorial 1: Mendelian Genetics and Punnett Squares

1. Depending on whether you've learned this material in class, you can view or skip through the opening slide show.
2. Complete the "Cystic fibrosis" Interactive Reading. Check the box when you're done.

Reflection: At a party, you hear that a neighbor has had a baby with cystic fibrosis. A friend who has not studied biology asks you to explain what it is. Based on what you've read, write a 3 sentence explanation below.

3. Extending your learning: Follow the link to the Genetics Home Reference page about Cystic fibrosis (which will open in a new tab). Set a timer to five minutes, and spend that time reading the 1st three sections (description, frequency, and genetic changes). Fill the space below with additional material that you've learned.

4. Complete the Genetics Vocabulary Flashcards.

Reflections: Why is it easier to tell a person's phenotype than their genotype?

5. Complete the reading about Punnett squares. Complete the three guided Punnett squares.

Checking Understanding: Mendel found that in Pea plants, purple flower color(P) is dominant to white (p). Cross a white pea with a heterozygote. Complete all six steps, and show your work below.

Follow the link to the next tutorial

Tutorial 2. Solving ABO Blood Type Problems.

1. You can go through the slideshow, or skip it.
2. Reading "Blood type and blood transfusions." Then complete the interactive table, and the interactive reading. Check the box when you're finished.

Checking Understanding:

Whereas cystic fibrosis has _____ alleles and _____ phenotypes, blood type has _____ alleles and _____ phenotypes

Reflection: You hear on the radio that in response to an earthquake in Indonesia, the Red Cross is asking for blood donations, especially type O. Your 8th grade neighbor, knowing that you're studying biology, says "what's type O?" Briefly explain blood type to her.

3. Read "The Genetics of ABO Blood Type," including the "Blood type: Genotype and Phenotypes" interactive table.

Knowing the terms:

Define *multiple alleles*:

Define *Co-dominance*:

4. Follow the links in "Extending Your Learning." Read for a few minutes, and record what you've learned in the space below.

5. Complete the Interactive Punnett Squares for the two blood type problems in this tutorial

Follow the link to the next tutorial

Tutorial 3: Sex-Linked Alleles

1. Depending on whether you're completing this tutorial before or after lecture, you can read or skip the slideshow.
2. Complete the "Reading about Hemophilia," and complete the "Hemophilia Genotypes" chart.

Checking Understanding

You arrive home after a day at school, and someone asks you "What did you learn at school today?" Use the space below to explain how sex-linked genes work.

3. Read "A Pedigree for a Sex Linked Trait," and complete the interactive pedigree

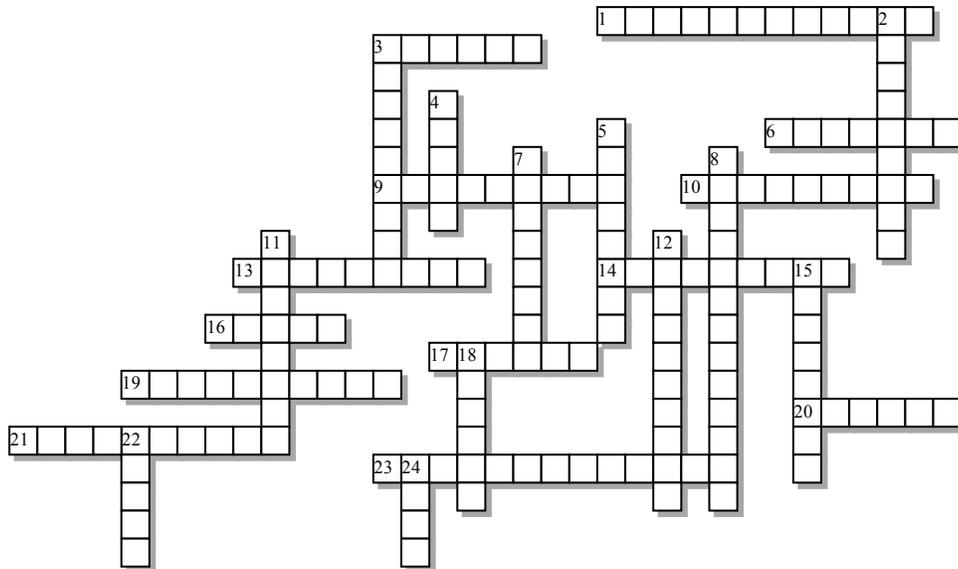
4. Read "Solving a Genetics Problem Involving Sex linkage," and complete the interactive Punnett square.

SUMMATIVE Reflection.

In these tutorials, you learned about inheritance of three types of alleles

- Regular autosomal alleles
- Multiple Alleles in the ABO blood type system
- Sex linked alleles

In the space below, use terms like *as opposed to*, *In contrast to*, *is similar to*, *is different from*, *as with*, etc, to compare and contrast the way these three types of alleles are inherited.

Genetics**Across:**

- 1 - When you possess two different alleles for a trait
 3 - The Austrian monk who discovered the basic principles of genetics.
 6 - In genetics, this square is awfully useful
 9 - _____ genes are found on any chromosome except the X or Y
 10 - An allele on the X chromosome causes red green color _____
 13 - An allele that can be masked by the dominant one.
 14 - Your appearance
 16 - The blood of hemophiliacs _____ very slowly, if at all.
 17 - Hemophilia is caused by a defective clotting _____.
 19 - When both of your alleles for a trait are the same
 20 - The royal family of this large, cold northern country had a problem with hemophilia.
 21 - The allele for hemophilia is on the X _____.
 23 - A big word for happens in the blood if the wrong blood type is transfused

Down:

- 2 - Type O is the _____ donor
 3 - Cystic fibrosis is caused by a faulty transport protein on cell _____.
 4 - Fruit flies with an X-linked mutation have _____ eyes
 5 - If there are more than two alleles (as in blood type), we say there are _____ alleles.
 7 - An allele that always shows up in the phenotype
 8 - The ABO blood type system is about _____ on your red blood cells.
 11 - Your underlying alleles
 12 - A sex-linked recessive blood disorder
 15 - A chart used to show inheritance of a gene or trait
 18 - An alternative version of a gene
 22 - People with cystic fibrosis can't clear _____ from their lungs.
 24 - A man's name and a unit of heredity

Word bank: Mendel, Punnett, Russia, agglutination, allele, autosomal, blindness, chromosome, clots, dominant, factor, gene, genotype, glycoproteins, hemophilia, heterozygous, homozygous, membranes, mucus, multiple, pedigree, phenotype, recessive, universal, white